SAMSUNG

INSTALLATION MANUAL

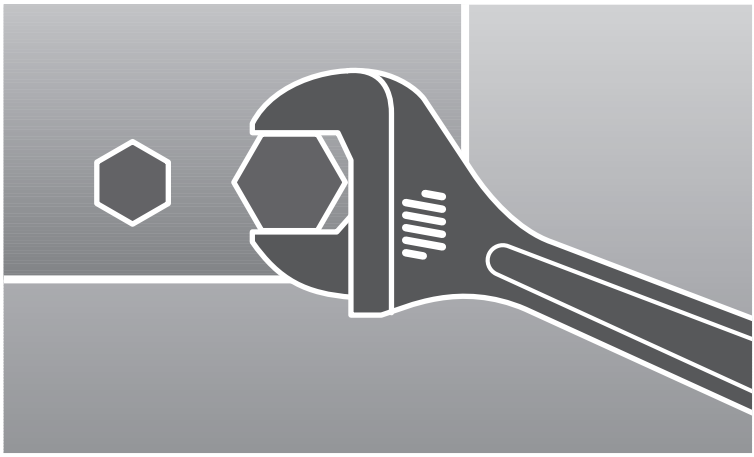
Outdoor Unit

RD060PHXEA
RD070PHXEA
RD080PHXEA
RD110PHXEA
RD140PHXEA
RD160PHXEA

ENGLISH
ESPAÑOL
FRANÇAIS
ITALIANO
PORTUGUÊS
DEUTSCH

Air to Water Heat pump

R410A



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Safety Precautions

- ***You must install the product by qualified installer. If you install the product on your own or by unqualified person, Samsung is not responsible for any damages which may occur due to incorrect installation.***
- ***Make sure to read the following safety precautions carefully before installation.***
- ***Make sure to observe the cautions specified in this manual.***
- ***Conduct a test run of the unit after installation and then explain all system functions to the owner.***

❖ ***Follow IEC (International Electrotechnical Commission) standards for the power input and ISO (International Standards Organization) standards for input current.***

✳ R410A refrigerant is used for Air to Water Heat pump.
- When using R410A, moisture or foreign substances may affect to the capacity and reliability of the product. Safety precautions must be taken when installing the refrigerant pipe.
- The design pressure of the unit is 4.1MPa (41.8 kgf/cm^2). Select appropriate material and thickness according to the regulations.
- R410A is a quasi-azeotrope of two refrigerants. Make sure to charge liquid one when adding refrigerant. If you charge gaseous refrigerant, it may affect the capacity and reliability of the product as a result of change formation of the refrigerant.

✳ Connect only the indoor units fit on R410A refrigerant. Check whether the indoor units can be connected with the product's catalogue. (When incorrect indoor units are connected, they cannot operate normally.)

✳ When installing, use tools and materials for R410A only. If you use tools and materials for R22, there is potential risk of bursting, injury, electric shock and fire because the pressure of R410A is higher than the pressure of R22(conventional).

⚠***WARNING*** • Hazards or unsafe practices that may result in **severe personal injury or death.**

⚠***CAUTION*** • Hazards or unsafe practices that may result in **minor personal injury or property damage.**

⚠ WARNING

Hazards or unsafe practices that may result in severe personal injury or death.

- Installation must be carried out by a qualified installer. Do not attempt to repair, move, modify or reinstall the unit on your own since such act may cause fire, electric shock or water leakage.
- Install the unit in a place where it is strong enough to hold the product weight. When installed in place where it is not strong enough to withhold the product weight, the unit could fall and cause injury.
- The unit should be installed in accordance with the National Electrical regulations. Check if the voltage and the frequency of the main power supply are those required for the unit to be installed and check the connection. Do not share the power outlet with other appliances. Incomplete connection, defective insulation or exceeding the permissible current may cause electric shock or fire.
- Use the specified wires to connect the indoor and outdoor units securely and attach the wires firmly to the terminal block connecting sections so that the pressure is not applied to the sections. Inappropriate connection and fixing could cause fire.

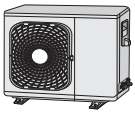
- Attach the electrical cover to the indoor and outdoor unit securely without any gaps. If there are any gaps, there is potential risk of fire or electric shock due to dust or water.
- Make sure to use the part provided or specified parts for the installation work. The use of defective parts could cause an injury or leakage of water due to a fire, an electric shock, the unit falling, etc.
- Make sure that the refrigerant gas does not leak after completing the installation. If the refrigerant gas of the indoor unit leaks and comes into contact with the fan heater, space heater or stove, harmful gas will be generated.
- Ensure that the national safety code requirements have been followed for the main supply circuit. Ensure that a proper ground wire is in place. Do not connect the ground to a gas pipe, water pipe, lightning rod or telephone grounding. Defective grounding could cause electric shock.
- Do not install the unit in a place with direct sunlight, dangerous substances or where it is exposed to inflammable gas leakage to prevent explosion, fire or personal injury.
- Perform the installation securely referring to the installation manual. Incomplete installation could cause personal injury due to fire, electric shock and water leakage or from the unit falling.
- Check first the following situations before starting the operation during the installation.
  - The pipe must be properly connected and make sure there is no leakage.
  - Service valves must be open. If compressor is operated with the service valve closed, excessive pressure may damage parts of the compressor.
    If leakage occurs on any of the connection, air inflow may also cause excessive pressure that could lead to explosion.
- Stop the compressor before disconnecting the refrigerant pipe for pump-down operation. If you disconnect the refrigerant pipe while compressor is operating with service valve open, air inflow will cause excessive pressure in the refrigerant cycle that could lead to explosion and personal injury.
- Do not assemble the power cord on your own, use two cables together to extend the cable length or tangle the cable. Bad connection, isolation and over voltage may cause fire or electric shock.
- Make sure to turn off the main power when setting up the indoor unit electrical circuit or power cords. There is a risk of electric shock.
- Make sure that proper circuit breaker and safety switches are installed. Install a ground leakage breaker depending on the installation place (where it is humid). If not, it may cause electric shock.
- Do not install the unit by yourself (owners). Incorrect installation of the unit could cause injury due to fire, electric shock and water leakage or from the unit falling. Consult a dealer or a qualified installer.
- Use the unit on a single outlet circuit. Do not share the power outlet with other appliances. Obtain the consent by a qualified installer before connecting the unit to the power supply system. An all pole disconnection from the power supply must be incorporated in the fixed wiring with a contact opening of >3mm.
- Manufacturer is not responsible for accidents due to incorrect installation.
- When you install the Air to water heat pump in a small room, you consider a proper ventilation to prevent a leakage level within the maximum permissible limit.
  - In that case, you may die from suffocation by some possibility.
- Fix the outdoor unit securely to prepare against strong wind or earthquake.
  - If the outdoor unit is not properly fixed, it turns over and accidents may occur.
- If any gas or impurities except R410A refrigerant come into the refrigerant pipe, serious problem may occur and it may cause injury.
- Install the cables with supplied cables firmly. Fix them securely so that external force is not exerted to the terminal board.
  - If the connection or fixing is incomplete, it can cause trouble with a heat generation, electric shock or fire and so on.

CAUTION Hazards or unsafe practices that may result in minor personal injury or property damage.

- Perform the drainage/piping work securely according to the installation manual. If not, water could drop from the unit and household goods could get wet and damaged.
- Fasten a flare nut with a torque wrench as specified in this installation manual. When fastened too tight, a flare nut may break after a long period of time and cause refrigerant leakage.
- Wear thick gloves during the installation process. If not, personal injury may occur due to the Air to water heat pump parts.
- Be careful not to touch the outdoor unit inlet or aluminum pins. You may get personal injury.
- Do not install the outdoor unit in a place where animals could live. If an animal get contact with the electric parts, damage or fire may occur. In addition ask the customer to maintain a clean installation place around it.
- After completing the installation run the trial operation. If no error occurs, explain to the customer how to use and clean the Air to water heat pump according to the user's manual. In addition give the installation manual and the user's manual to the customer.
- Check the unit for damage that may have taken place during transportation and do not install or use damaged equipment.
- All of the manufacturing and packaging material used for your new appliance are compatible with the environment and can be recycled.
- Dispose of the packaging material in accordance with the local requirements.
- This product is an air conditioning system and contains a coolant that must be recovered and disposed of in an appropriate way by qualified personnel. At the end of the life cycle, take it to a proper recycling or disposal center or return it to the dealer so that it can be disposed correctly.
- Do not connect the heater to the outdoor unit and do not install remodeled duct as you please.
  - The capacity of the Air to water heat pump may reduce, electric shock or fire may occur and it has a chance of occurrence of and accident like electric shock or fire.
- Make sure that the condensed water dripping from the drain hose runs out properly and insulate the drain pipe so that frost does not generate.
  - Household goods may get wet if the drain pipe is not properly installed.
- Install the power cable and communication cable of the indoor and outdoor unit at least 1.5m away from electric appliances.
  - Noise may hear depending on the electric wave though the cables are installed away from electric appliances.
- Install the indoor unit away from lighting apparatus using the ballast.
  - If you use the wireless Remote controller, it may not operate normally.

Product Specification

Shape of the outdoor unit

Shape		
Model Name	RD060PHXEA RD070PHXEA RD080PHXEA	RD110PHXEA RD140PHXEA RD160PHXEA

Accessories

- Keep supplied accessories until the installation is finished.
- Hand the installation manual over to the customer after finishing installation.
- The quantities are indicated in parentheses.

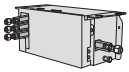
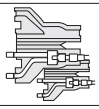
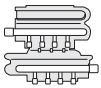
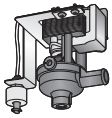
Installation manual (1)	Drain plug (2)	Fastener-nut(1)	Rubber-cover wire(2)	Drain cap (1)

Product compatibility

Indoor unit / Outdoor unit		Duct Line	RAC Line		A2W Line
		Slim Duct	Vivace	Neo-Forte	Hydro Unit
		2.2~5.6kW	2.2~7.1kW	2.2~7.1kW	8/16kW
Classification	Features	Slim Duct	Premium RAC	RAC	Hydro Unit
	- Heat pump for heating and hot water system [Eco Heating Full System] - Outdoor unit : 6/7/8/11/14/16 kW - Long pipe reliability : 75m - Eurovent LCP, NF PAC registration	NH022LHXEA NH028LHXEA NH036LHXEA NH045LHXEA NH056LHXEA	NH022VHXEA NH028VHXEA NH036VHXEA NH056VHXEA NH071VHXEA	NH022NHXEA NH028NHXEA NH036NHXEA NH056NHXEA NH071NHXEA	NH080PHXEA NH160PHXEA

- RD✳✳✳PHXEA and NH✳✳✳✳HXEA products are applicable for EHS_GEN2 products only. They are not compatible with CAC, DVM and FJM products.
- A2W: Air to Water
  A2A: Air to Air

Subsidiary materials compatibility

Indoor unit / Subsidiary materials		Duct	Wall mounted		Air to Water unit	Remark
		Slim Duct	Vivace	Neo-Forte	Hydro Unit	
Capacity		2.2~5.6kW	2.2~7.1kW	2.2~7.1kW	8/16kW	
EEV Kit	 EEV kit for 2/3 room	-	MXD-A13K116B MXD-A13K200B MXD-A16K200B MXD-A13K216B MXD-A13K300B MXD-A16K231B MXD-A16K300B	≤3.6kW 1room + ≥5.6kW 1room ≤3.6kW x 2room ≥5.6kW x 2room ≤3.6kW 2room + ≥5.6kW 1room ≤3.6kW x 3room ≤3.6kW 1room + ≥5.6kW 2room ≥5.6kW 3room	-	Requisite
Y-joint		MXJ-YA1509K (≤15.0kW and below)				Requisite
Header-joint		MXJ-HA2512K (Below 46.4 kW)				Option
Drain Pump		MDP-E075SEE	-	-	-	Option
Wireless remote controller		MR-BH01	Included	Included	-	Option
Remote controller receive kit		MRK-A00	-	-	-	Option
Wired remote controller		MWR-TH01	-	-	Included	Option
Domestic Hot Water tank	DHW tank (200/300L, 200/300S)	-	-	-	NH300WHXES NH300WHXEA NH200WHXES NH200WHXEA	Option

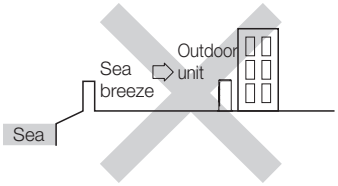
- Subsidiary materials are compatible with CAC, DVM and FJM products.
- Install distribution kit for 1, 2 or 3 rooms on the ceiling or outdoor area.
- A2W: Air to Water
  A2A: Air to Air

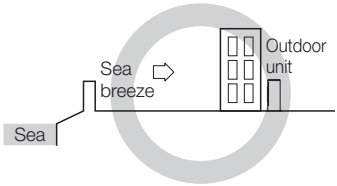
Deciding on Where to Install the Outdoor Unit

Decide the installation location regarding the following condition and obtain the user's approval.

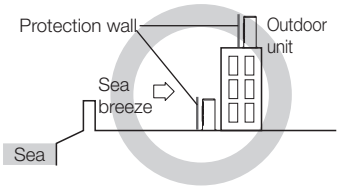
- The outdoor unit must not be placed on its side or upside down, as the compressor lubrication oil will run into the cooling circuit and seriously damage the unit.
- Choose a location that is dry and sunny, but not exposed to direct sunlight or strong winds.
- Do not block any passageways or thoroughfares.
- Choose a location where the noise of the Air to water heat pump when running and the discharged air do not disturb any neighbours.
- Choose a position that enables the pipes and cables to be easily connected to the indoor unit.
- Install the outdoor unit on a flat, stable surface that can support its weight and does not generate any unnecessary noise and vibration.
- Position the outdoor unit so that the air flow is directed towards the open area.
- Place the outdoor unit where there are no plants and animals because they may cause malfunction of outdoor unit.
- Maintain sufficient clearance around the outdoor unit, especially from a radio, computer, stereo system, etc.
- When installing the outdoor unit near seashore, make sure it is not directly exposed to sea breeze. If you can not find a adequate place without direct see breeze, make sure to apply anti-corrosion coating on the heat exchanger.

- Install the outdoor unit in a place (such as near buildings etc.) where it can be prevented from sea breeze which can damage the outdoor unit.





- If you cannot avoid installing the outdoor unit by the seashore, construct a protection wall around to block the sea breeze.



▶ Protection wall should be constructed with a solid material such as concrete to block the sea breeze and the height and the width of the wall should be 1.5 times larger than the size of the outdoor unit. Also, secure over 700mm between the protection wall and the outdoor unit for exhausted air to ventilate.

- Install the outdoor unit in a place where water can drain smoothly.

❊ **If you cannot find a place satisfying above conditions, please contact manufacturer. Make sure to clean the sea water and the dust on the outdoor unit heat exchanger.**

- Do not install the Air to Water Heat pump in following places.
  - The place where there is mineral oil or arsenic acid.
    There is a chance that parts may get damaged due to burned resin.
    The capacity of the heat exchanger may reduce or the Air to Water Heat pump may be out of order.
  - The place where corrosive gas such as sulfurous acid gas generates from the vent pipe or air outlet
    The copper pipe or connection pipe may corrode and refrigerant may leak.
  - The place where there is a danger of existing combustible gas, carbon fiber or flammable dust.
    The place where thinner or gasoline is handled.

CAUTION

Do not install the outdoor unit in a snowy and cold area (low temperature and high humidity area - where the temperature is below -7°C and humidity is higher than 85%) because according to operation condition (defrost, etc.), ice may be formed in the drain route.
If the ice is accumulated, it may cause critical damage to the product.
ex) lakeside of cold area in winter time, seashore, alpine region and etc.

CAUTION

- ***You have just purchased Air to Water Heat pump and it has been installed by your installation specialist.***
- ***This device must be installed according to the national electrical rules.***
- ***With an outdoor unit having net weight upper than 60kg, we suggest do not install it suspended on wall, but considering floor standing one.***

- Avoid a place that may disturb your neighbor. Noise may occur from the outdoor unit and the discharged air may run into the neighborhood.
  (Be careful of the operation time in a residential area.)
- Install the outdoor unit on a hard and even area that can support its weight.
- Choose a flat place that rainwater does not settle or leak.
- Choose a place avoiding strong winds.
- Maintain sufficient space for repairs and service.
- Choose a place where you can easily connect the pipes and cables to the indoor unit.
- Make sure that the condensed water dripping from the drain hose runs out properly and safely.
- If you install the outdoor unit by the sea or a spa, concern about corrosion.
- Build a support where may have a heavy snow so that the air intake is not blocked by snow.
- Install a protective safety fence to eliminate the possibility of falling.

Space Requirements for Outdoor Unit

- Observe the clearances and dimensions as seen below when installing the outdoor unit.
- If you install several outdoor units simultaneously, observe the space for ventilation and free airflow.
  If the space for ventilation is insufficient, the Air to water heat pump may be inefficient.
- SAMSUNG logo is attached on the front side of the outdoor unit.

✻ Figure Description

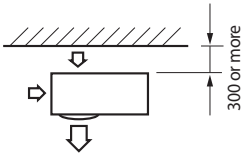
Top view	Side view
Back side: Air intake Front side: Air outlet	Front side: Air outlet Back side: Air intake

• , Air flow direction.

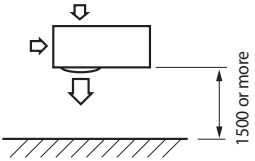
When installing 1 outdoor unit

(Unit : mm)

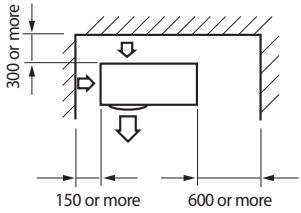
✳ When the air outlet is opposite the wall



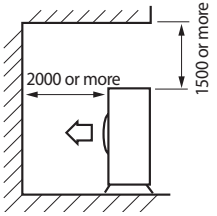
✳ When the air outlet is toward the wall



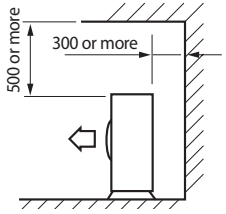
✳ When 3 sides of the outdoor unit are blocked by the wall



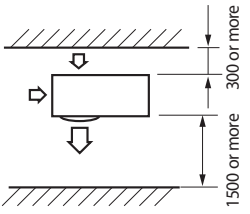
✳ The upper part of the outdoor unit and the air outlet is toward the wall



✳ The upper part of the outdoor unit and the air outlet is opposite the wall



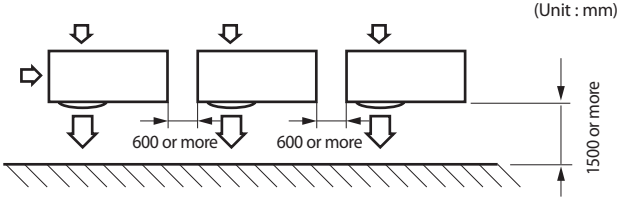
✳ When the walls are blocking front and the rear side of the outdoor unit



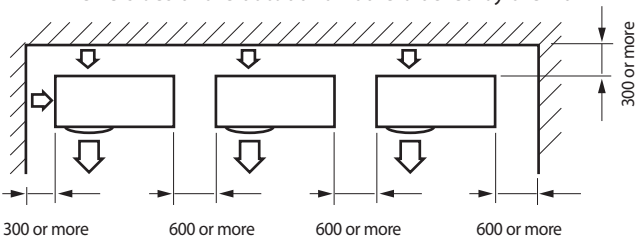
When installing more than 1 outdoor unit

✳ When the air outlet is toward the wall

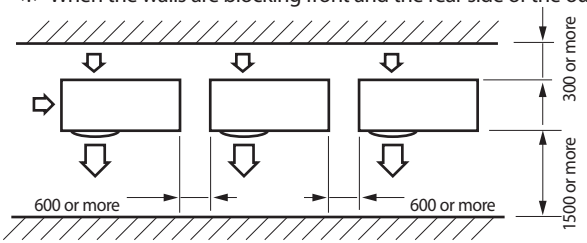
(Unit : mm)



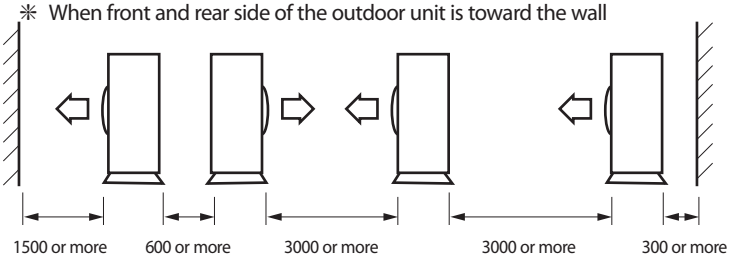
✳ When 3 sides of the outdoor unit are blocked by the wall



✳ When the walls are blocking front and the rear side of the outdoor units



✳ When front and rear side of the outdoor unit is toward the wall



Selecting Outdoor Unit Combination

◆ Install the Hydro unit only for R410A.

Outdoor unit	Heating capacity (kW)	Maximum of connected indoor units	Total capacity of connected indoor units (kW)
RD060PHXEA	6.0	3	3.0~6.0
RD070PHXEA	7.0	4	3.5~7.0
RD080PHXEA	8.0	5	4.0~8.0
RD110PHXEA	11.0	5	6.0~11.0
RD140PHXEA	14.0	5	6.4~14.0
RD0160PHXEA	16.0	5	7.2~16.0

◆ You may connect indoor units within 100% of the outdoor unit capacity.
Smallest indoor unit(2.2kW) was used to calculate 'Maximum of connected indoor units'.
◆ Connect maximum 5 indoor units to the selected outdoor unit.
◆ Total capacity of connected indoor units must be within 130% of the outdoor unit capacity.
◆ If all indoor units operate simultaneously when total capacity of indoor units exceeds 100% of the outdoor unit, actual capacity of each indoor unit may be reduced a little as compared with its rated capacity.

Tools Required for Installation

General Tools

◆ Vacuum Pump(Backward flowing prevention)
◆ Manifold Gauge
◆ Stud Finder
◆ Torque Wrench
◆ Pipe Cutter
◆ Reamer
◆ Pipe Bender
◆ Spirit Level
◆ Screw Driver
◆ Spanner
◆ Drill
◆ L Wrench
◆ Measuring Tape

Tools for test operations

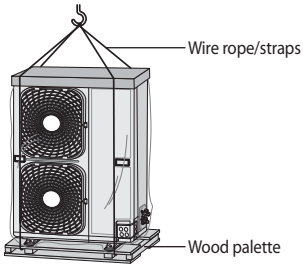
◆ Thermometer
◆ Resistance Meter
◆ Electroscope

Moving the Outdoor Unit

◆ Select the moving route.
◆ Secure the strength of the carrying path to resist against the weight of the outdoor unit.
◆ Do not slant the product more than 30˚ when carrying it. (Do not lay the product down sideways.)
◆ The surface of the heat exchanger is sharp. Be careful not to be get injury while moving.

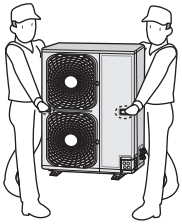
When moving with a crane or straps

◆ In case of placing the outdoor unit on a high ground such as rooftop
- Fasten the wire rope as seen in the picture.
- Move the product with its package on, to prevent any damages caused by the rope.



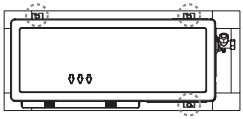
When moving by installation personnel

- When the moving distance of the product is close enough for installation personnel to carry.
  - 2 people should move the product using the carry handle as shown in the picture.
  - Be careful not to damage the heat exchanger.
  - Be careful not to get injured by the sharp edge of the heat exchanger.



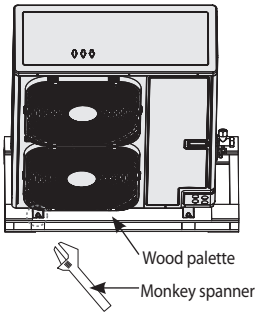
Disassembling the Leg Base and Wood Palette / Fastening the Anchor Bolt

1 Disassemble the three screws (with an electric driver) which fixes wood palette.



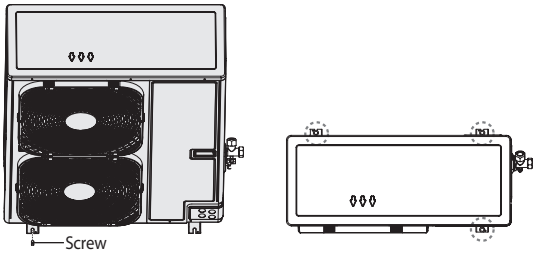
2 Disassemble the bottom-left screw with monkey spanner.

◆ Do not remove guard fan.



3 After removing the wood palette, move the outdoor unit to the installation place.

4 Fasten the bottom-left screw with monkey spanner first, and then fasten the other three anchor bolts.

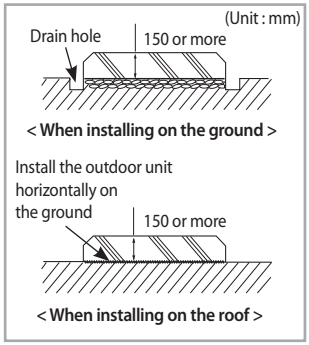


Installing the Outdoor Unit

CAUTION

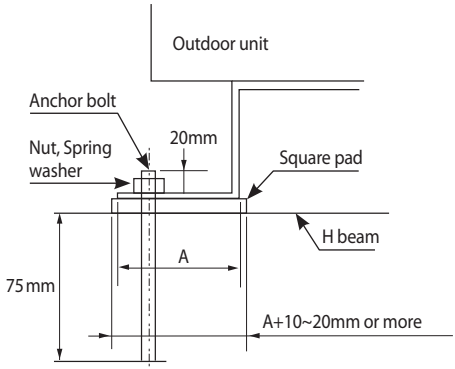
- ***Do not install the outdoor unit on a wood palette.***
- ***Fix the outdoor unit completely to the base surface with anchor bolts.***
- ***The manufacturer is not responsible for the damage occurred by not keeping standard of the installation.***

- Install the outdoor unit higher than 150mm from the base surface and install the drain hole to connect the pipe to the drainage.
- If forward fan outdoor unit is installed where has average fallen snow 150mm over, outward duct should be attached to the outdoor unit.
- The concrete foundation should be 1.5 times larger than bottom of the outdoor unit.
- When heating, condensed water may be generated. Pay attention to waterproof and drainage of the concrete foundation where the outdoor unit is installed. (An ice road may form on the base surface in winter.)
- Make up for wire mash or steel bar so that the outdoor unit is not damaged or broken when installing concrete foundation.



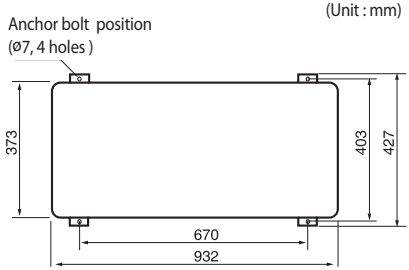
✳ Base mount construction

- When installing the outdoor units in same place simultaneously, install the H beam inside concrete foundation. (When installing a number of outdoor unit, you can install it on the concrete foundation.)
- Install the H beam(150mm x 150mm x t10 : basic specification) to jut out from the concrete foundation.
- After installing the H beam, apply corrosion protection.
- Install a square pad(t=20mm or more) to prevent vibration of the outdoor unit delivering to the base surface when installing the concrete for the outdoor unit.
- Place the outdoor unit on the H beam and fix it with the bolt, nut and washer.



Outdoor unit base mount and anchor bolt position

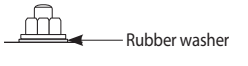
(Unit : mm)



CAUTION

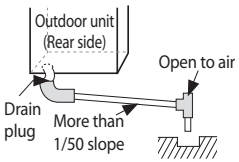
When tightening the anchor bolt

Tighten the rubber washer to prevent the outdoor unit bolt connection part from corroding.

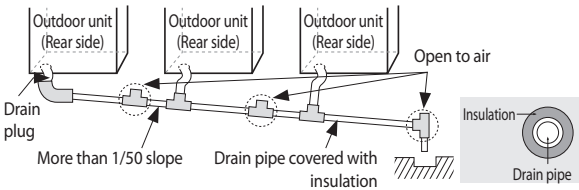


Installing the drain pipe

◆ ***When installing 1 outdoor unit***



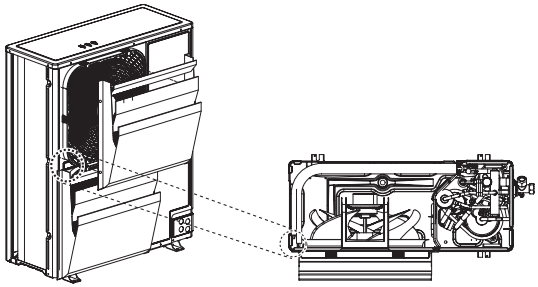
◆ ***When installing more than 1 outdoor unit***



- Open the upside of connected parts of outdoor units to prevent inner pressure.
- Do not place a trap on the concentrated pipe. And install the drain pipe horizontally with a slope of 1/50 or more.
- Insulate the drain pipe and drain plug by using the insulation over 10mm.
- Install a self-regulation heat cable to prevent the drain pipe from freezing.

Caution When Installing Cover for Heating Air Direction Change

◆ Parts shown in the picture is where the copper pipe may be passing by or the external plate may be near the copper pipe. When using screw for installing the air direction changing device such as heating air cover, check and make sure that it does not damage the copper pipe.



< Internal view from bottom>

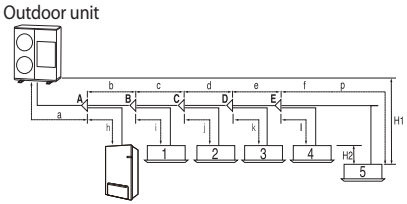
Installing the Refrigerant Pipe Work

- Install the refrigerant pipe within the maximum allowable length, difference in height and length of after the first branch pipe.
- The pressure of the R410A is high.
  Use only rated refrigerant pipe and follow the installation method.
- Use clean refrigerant pipe which there is no harmful ion, oxide, dust, iron content or moisture.
- Use tools and accessories fit on R410A.

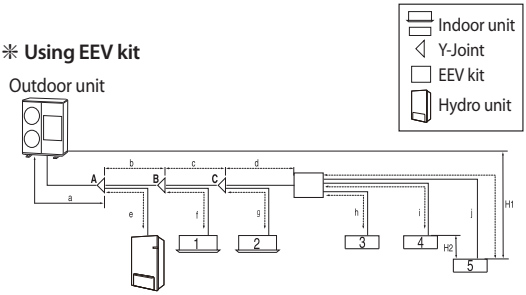
Manifold gauge	• Use manifold gauge only for R410A to prevent the inflow of foreign substances.
Vacuum pump	• Use vacuum pump with check valve to prevent pump oil from flowing backward while the vacuum pump is stopped. • Use the vacuum pump that the vacuum induction is available up to 5Torr (666.6Pa , 0.0067 kgf/cm^2, 5 mmHg)
Flare nut	• Use only flare nut supplied with the product.

Allowable Length of the Refrigerant Pipe and the Installation Examples

✳ **Using only Y-joint**



✳ **Using EEV kit**



Item				Example	Remarks
Maximum allowable length of pipe	Outdoor unit ~ Indoor units	Longest piping length	Less than 70m	a+b+c+d+j ≤ 70m	
		Equivalent length	Less than 85m	Y-joint and EEV kit : 0.5m	
		Total length	Less than 200m	a+b+c+d+e+f+g+h+i+j ≤ 200m	10m≤Total length ≤200m
Maximum allowable height	Outdoor unit ~ Indoor units	Less than 30m		H1	If outdoor unit is located lower position H1 ≤ 25m
	Indoor unit ~ Indoor unit	Height difference between indoor units	Less than 15m	H2	
Maximum allowable length of pipe	First Y-joint ~ Last indoor unit	Actual piping length	Less than 40m	b+c+d+h ≤ 40m (between first Y-joint and indoor unit) h≤20m(between EEV kit and indoor unit)	
Additional refrigerant calculation	R=Basic charge + additional charge by the piping length Basic charge : Up to 10m when installing A2W only = 3300g When installing A2W and A2A together, add basic additional refrigerant (700g)=4000g				

✳ Contact the manufacturer if the length should exceed.

Selecting the Refrigerant Pipe

✳ **Installing pipes between outdoor unit and first Y-joint**

Outdoor unit capacity (kW)	Liquid side (mm)	Gas side (mm)	Gas side size up (mm)
RD060PHXEA	ø9.52	ø15.88	ø19.05
RD070PHXEA	ø9.52	ø15.88	ø19.05
RD080PHXEA	ø9.52	ø15.88	ø19.05
RD110PHXEA	ø9.52	ø15.88	ø19.05
RD140PHXEA	ø9.52	ø15.88	ø19.05
RD160PHXEA	ø9.52	ø15.88	ø19.05

- Install refrigerant pipe depending on the outdoor unit capacity.
- Use the copper pipe of semi-hard(1/2H) when installing Ø19.05 of the pipe.
  If you use Soft(O) pipe, the internal pressure is too low to cause personal injury.
- When the length of liquid pipe is longer than 70m, step up the size of gas pipe.

Outer diameter (mm)	Minimum thickness (mm)	Temper grade
ø 6.35	0.8	C1220T-O (Soft)
ø 9.52	0.8	
ø12.70	0.8	
ø15.88	1.0	
ø19.05	1.0	C1220T-1/2H (Semi-hard)
ø22.23	1.0	

✳ Temper grade and minimum thickness of the refrigerant pipe

✳ **Installing pipes between Y-joints**

Indoor unit total capacity (kW)	Liquid side (mm)	Gas side (mm)
X < 20.2	ø9.52	ø15.88

Selecting the Y-joint

- Select the first Y-joint depending on the outdoor unit capacity.
  Select the other Y-joints depending on the total capacity of attached indoor units below the selected joint individually.

Selecting the first Y-joint	
Outdoor capacity (kW)	Y-joint model
RD060PHXEA	MXJ-YA1509K
RD070PHXEA	
RD080PHXEA	
RD110PHXEA	
RD140PHXEA	
RD160PHXEA	

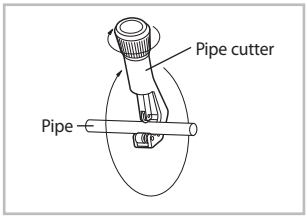
The other Y-joint	
Total capacity of attached indoor units below this Y-joint (kW)	Y-joint model
X < 20.2	MXJ-YA1509K

Keeping Refrigerant Pipe Clean and Dry

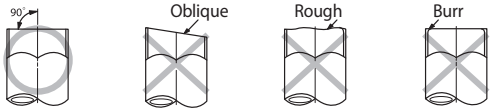
- To prevent foreign materials or water from entering the pipe, it is important to keep the refrigerant pipe and to seal it while installing.

Cutting or Flaring the Pipes

1 Make sure that you have the required tools available. (pipe cutter, reamer, flaring tool and pipe holder)

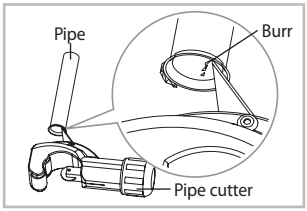


2 If you wish to shorten the pipes, cut it with a pipe cutter, taking care to ensure that the cut edge remains at a 90° angle with the side of the pipe. Refer to the illustrations below for examples of edges cut correctly and incorrectly.



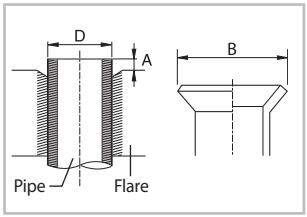
3 To prevent a gas leak, remove all burrs at the cut edge of the pipe using a reamer.

CAUTION Face the pipe down while removing the burrs to make sure that burrs do not get in to the pipe.



4 Put a flare nut slightly into the pipe and modify the flare.

Outer Diameter (D)	Depth (A)	Flaring Size (B)
ø6.35 mm	1.3 mm	9.0 mm
ø9.52 mm	1.8 mm	13.0 mm
ø12.70 mm	2.0 mm	16.2 mm
ø15.88 mm	2.2 mm	19.3 mm
ø19.05 mm	2.2 mm	22.5 mm

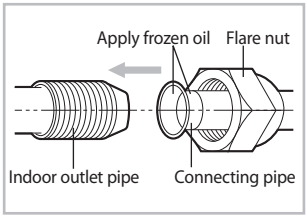


5 Check that the flaring is correct, referring to the illustrations below for examples of incorrect flaring.

6 Align the pipes to connect them easily. Tighten the flare nuts first with your hands, and then with a torque wrench, applying the following torque:

Outer Diameter	Torque (kgf•cm)
ø6.35 mm	140~170
ø9.52 mm	250~280
ø12.70 mm	380~420
ø15.88 mm	440~480
ø19.05 mm	990~1210

Note Excessive torque can be cause of gas leakage.



CAUTION

In case of brazing the pipe, you must weld with Nitrogen gas blowing.

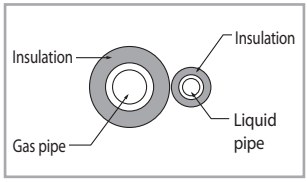
Selecting the Insulation of the Refrigerant Pipe

- Insulate the gas side and liquid side pipe referring to the thickness according to the pipe size.
- The thickness according to the pipe size is a standard of the indoor temperature of 27°C and humidity of 80%. If installing in an unfavorable conditions from it, use thicker one.

Pipe size (mm)	Minimum thickness of insulation (mm)		Remarks
	PE foam	EPDM foam	
ø6.35~ø19.05	13	10	If you install the pipe underground, at the seaside, a spa or on the lake, use thicker one according to the pipe size.
ø22.23	19	13	
-	25	19	

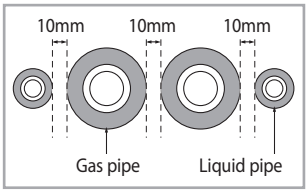
Refrigerant pipe before EEV kit or without EEV kit

- You can contact the gas side and liquid side pipes but the insulation should not be pressed.
- When contacting the gas side and liquid side pipe, use thicker insulation.



Refrigerant pipe after EEV kit

- When installing the gas side and liquid side pipes, leave 10mm of space.
- When contacting the gas side and liquid side pipe, use thicker insulation.



CAUTION

- ***Install the insulation not to be get wider and use the adhesives on the connection part of it to prevent moisture entering.***
- ***Wind the refrigerant pipe with insulation tape if it is exposed to outside sunlight.***
- ***Install the refrigerant pipe respecting that the insulation does not get thinner on the bent part or hanger of pipe.***

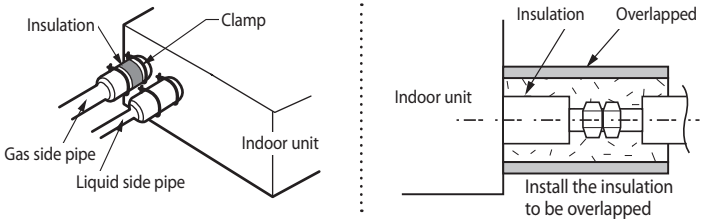
Insulating the Refrigerant Pipe

- You must check if there is a gas leak before completing all the installation process.
- Use EPDM insulation which meets the following condition.

Item	Unit	Standard	Remarks
Density	g/cm^2	0.048~0.096	KSM 3014-01
Dimension change route by heat	%	-5 or less	
Water absorption rate	g/cm^2	0.005 or less	
Thermal conductivity	kcal/m·h·°C	0.032 or less	KSL 9016-95
Moisture transpiration factor	ng/(m^2·s·Pa)	15 or less	KSM 3808-03
Moisture transpiration grade	{g/(m^2·24h)}	15 or less	KSA 1013-01
Formaldehyde dispersion	mg/L	-	KSF 3200-02
Oxygen rate	%	25 or less	ISO 4589-2-96

Insulating the refrigerant pipe

- Be sure to insulate the refrigerant pipe, joints and connections with class 'o' material.
- If you insulate the pipes, the condensed water does not fall from the pipes and the capacity of the Air to water heat pump is improved.
- Check if there are any insulation cracks on the bent pipe.



Brazing the Pipe

- Make sure that there is no moisture inside the pipe.
- Make sure that there are no foreign materials and impurities in the pipe.

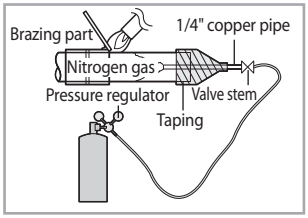
Replacement of Nitrogen gas

1 Use Nitrogen gas when brazing the pipes as shown in the picture.

2 If you do not use Nitrogen gas when brazing the pipes, oxide may form in the pipe. It can cause the damage of the compressor and valves.

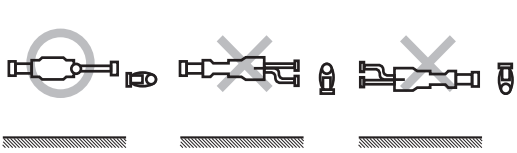
3 Adjust the flow rate of the replacement with a pressure regulator to maintain 0.05m^3/h or more.

4 Perform brazing of the service valve after protecting the valve.

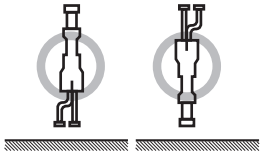


Installing the Y-Joint

- Install the Y-joint 'horizontally' or 'vertically'.



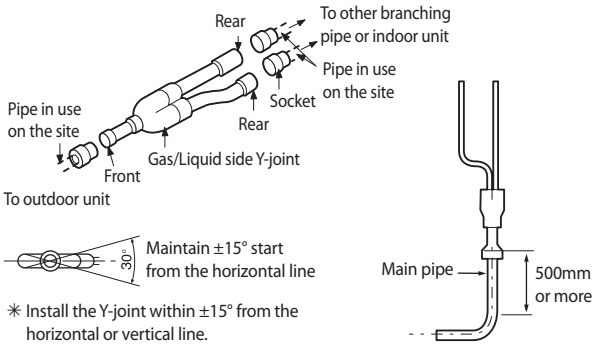
< Install horizontally>



< Install vertically>

CAUTION

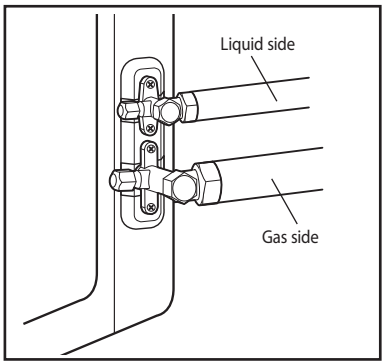
Make certain of a minimum distance in straight line.



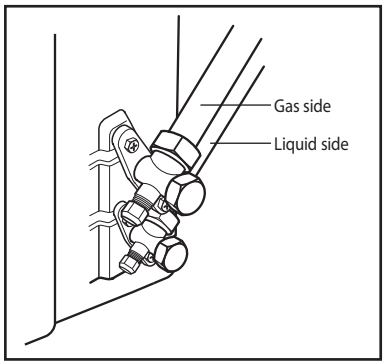
Connecting the Outdoor Unit Pipe

- Conduct a pipe work within maximum allowable length, height and length after branching.
- Make sure to have no crack on the bended parts of pipe.

6/7/8kW Outdoor unit



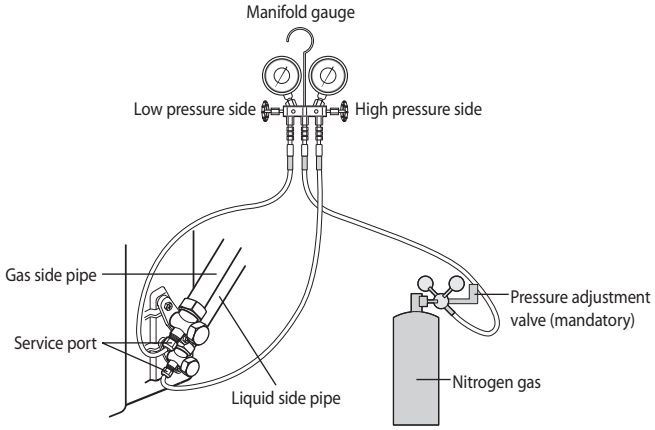
11/14/16kW Outdoor unit



Performing the Refrigerant Gas Leak Test

- Use tools for R410A to prevent the inflow of foreign substances and resist against the internal pressure.
- Pressure test with dry Nitrogen gas only.

Apply pressure to the liquid side pipe and gas side pipe with Nitrogen gas of 4.1 MPa (41.8 kgf/cm^2)	If you apply pressure more than 4.1MPa, the pipes may be damaged. Apply pressure using pressure regulator.
Keep it for minimum 24 hours to check if the pressure drops.	After applying Nitrogen gas, check the change of pressure using pressure regulator.
If the pressure drops, check if there is gas leak.	If the pressure is changed, apply soapy water to check the leak. Check the pressure of the Nitrogen gas again.
Maintain 1.0MPa of the pressure before performing vacuum drying and check further gas leak.	After checking first gas leak, maintain 1.0MPa to check further gas leak.



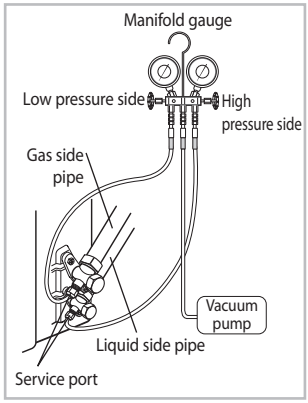
- Make sure to use a recommended bubble test solution for Gas Leak Test.
  Soap water could cause cracking of the flare nuts or lead to corrosion of flared joints.

CAUTION

You may get injured when the joint on the high pressure side detaches and the gas comes in contact with your body. Make sure to tighten the joint to prevent such accidents.

Vacuum Drying

- Use the tools for R410A to prevent the inflow of foreign substances and resist against the internal pressure.
- Use the vacuum pump with the check valve to prevent pump oil from flowing backward while the vacuum pump is stopped.
- Vacuum system to 5Torr (666.6Pa, 0.0067 kgf/cm^2, 5 mmHg).
- Close the service valve of the liquid side pipe and gas side pipe completely.



Connect the manifold gauge to the liquid side pipe and gas side pipe.

Perform vacuum drying of the liquid side pipe and gas side pipe using the vacuum pump.

Make sure that install check valve to prevent pump oil from flowing into the pipe.

Perform vacuum drying for 2 hours and 30 minutes or more.

The time of vacuum drying may differ depending on the length of the pipe or outdoor temperature.
Perform vacuum drying for at least 2 hours and 30 minutes.

Close the valve after checking the vacuum gauge pressure has reached at 5Torr.

Check the vacuum pressure using the vacuum gauge.

Pressure Increase

Yes

Check for gas leakage

Since there is water in pipeline, the pressure increases and vacuum condition is broken.
Exert pressure using 0.05 MPa nitrogen.

Vacuum desiccate again, to reach 5Torr (666.6Pa, 0.0067 kgf/cm^2, 5 mmHg). (2 hours and more)

Pressure Increase

Yes

No

Fill refrigeration agent

No

CAUTION

◆ ***If pressure rises in an hour, water remains the pipe or there will be a leak.***

Selecting Additional Refrigerant Charge

✳ **Basic charge**

The basic amount of refrigerant for outdoor unit charged in factory is :

Outdoor unit (Series)	Factory charge(kg)
RD060PHXEA RD070PHXEA RD080PHXEA	2.2
RD110PHXEA RD140PHXEA RD160PHXEA	3.3

✳ Charge additional refrigerant according to the total length of the pipe.

◆ Depends on the total length of the liquid side pipe.

- Air to Water

Additional Charge(g) = {L_1x20}+(L_2x50)}

- Air to Air

Additional Charge(g) = {L_1x20}+(L_2x50)} +700

Note ◆ L_1: Total length of liquid pipe Ø 6.35(m)
L_2: Total length of liquid pipe Ø 9.52(m)

Refrigerant Charging

✳ **Additional charging**

Additional Refrigerant calculation only related with liquid pipe length Basic refrigerant for outdoor unit already has been charged

Additional charge calculation = (Sum of total length(m) of Φ9.52)x50g + (Sum of total length(m) of Φ6.35)x20g + A2A Basic charge 700g

ex) a(Φ9.52)=40m, b+c+d(Φ9.52)=15m, e+f+g(Φ6.35)=15m
Additional charge = 55m x 50g + 15m x 20g + 700g = 3750g

✳ **Additional refrigerant calculation**

R = Basic charge + additional charge by the piping length

Basic charge = Up to 10m when installing A2W only = 3300g
When installing A2W and A2A together, add basic additional refrigerant (700g)=4000g

Note ◆ A2W: Air to Water
A2A: Air to Air

Charging refrigerant

- The R410A refrigerant is blended refrigerant. Add only liquid refrigerant.
- Measure the quantity of the refrigerant according to the length of the liquid side pipe. Add quantity of the refrigerant using a scale.

Important information regulation regarding the refrigerant used

This product contains fluorinated greenhouse gases covered by the Kyoto Protocol.
Do not vent gases into the atmosphere.

CAUTION

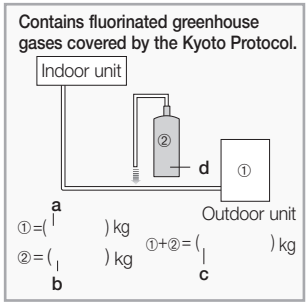
Inform user if system contains 3kg or more of fluorinated greenhouse gases. In this case, it has to be checked for leakage at least once every 12 months, according to regulation n°842/2006. This activity has to be covered by qualified personnel only.

In case situation above (3kg or more of R410A), installer (or recognized person which has responsibility for final check) has to provide a maintenance book, with all the information recorded according to REGULATION (EC) N° 842/2006 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on certain fluorinated greenhouse gases.

Please fill in with indelible ink,
- ① the factory refrigerant charge of the product.
- ② the additional refrigerant amount charged in the field.
- ①+② the total refrigerant charge.
  The refrigerant charge label supplied with the product.

Refrigerant type	GWP value
R410A	1975

✳ GWP=Global Warming Potential



Note

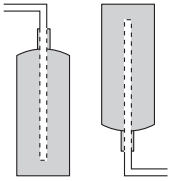
a. Factory refrigerant charge of the product : see unit name plate.
b. Additional refrigerant amount charged in the field. (Refer to the above information for the quantity of refrigerant replenishment.)
c. Total refrigerant charge.
d. Refrigerant cylinder and manifold for charging.

CAUTION

The filled-out label must be adhered in the proximity of the product charging port.
(ex. onto the inside of the stop valve cover.)

- Before charging, check whether the refrigerant cylinder has a siphon attached or not and position the cylinder accordingly.

Fillng using a cylinder with a siphon attached
Charge the liquid refrigerant with the cylinder in upright position.

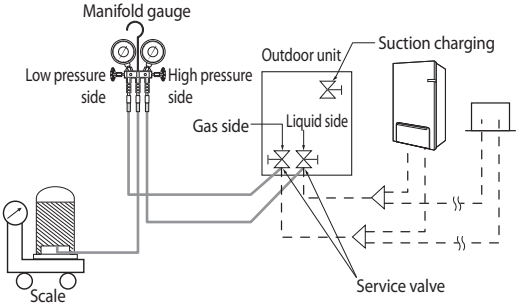


Fillng using a cylinder without a siphon attached
Charge the liquid refrigerant with the cylinder in up-side-down position.

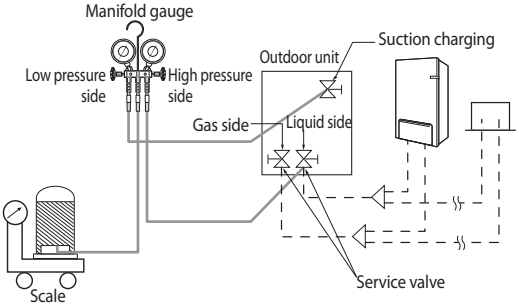
Adding Refrigerant

- The R410A refrigerant is blended refrigerant. Add only liquid refrigerant.
- Measure the quantity of the refrigerant depending on the length of the liquid side pipe. Add fixed quantity of the refrigerant using a scale.

※ Adding the cooling refrigerant



※ Adding the heating refrigerant

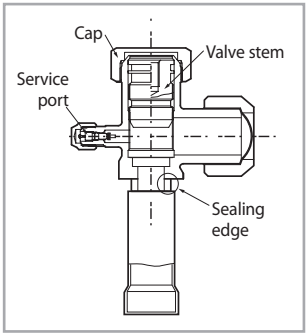


- Connect the manifold gage and purge the manifold gage.
- Open the manifold gauge valve of the liquid side service valve and add the liquid refrigerant.
- If you cannot fully recharge the additional refrigerant while the outdoor unit is stopped, use the key on the outdoor unit PCB to recharge the remaining refrigerant. (Refer to page 35.)
- Adding the cooling refrigerant
  1) Press the function key for adding refrigerant in cooling mode.
  2) After 20 minutes of operation, open the valve on gas side.
  3) Open the valve for low pressure side on the manifold gage to recharge the remaining refrigerant.
- Adding the heating refrigerant
  1) When recharging the heating refrigerant, connect the low pressure pipe from manifold gage to the suction charging port.
  2) Press the function key for adding refrigerant in heating mode.
  3) After 20 minutes of operation, open the valve on suction charge port.
  4) Open the valve for low pressure side on the manifold gage to recharge the remaining refrigerant.

CAUTION

Open the gas side and liquid side service valve completely after charging the refrigerant. (If you operate the Air to water heat pump with the service valve closed, the important parts may be damaged.)

To Close the Valve Stem



1 Open the cap and turn the valve stem clockwise by using a hexagonal wrench.

2 Tighten the valve stem until it reached the sealing edge.

Note

- Do not apply excessive force to the valve stem and always use special instruments. Otherwise, the contact surface between valve stem and sealing edge can be damaged and refrigerant can leak through this damaged surface.
- If refrigerant would leak, turn the valve stem back by half and tighten the valve stem again, then check the leakage. If there is no leakage any more, tighten the valve stem entirely.

3 Tighten the cap securely.

To Open the Valve Stem

1 Remove the cap.

2 Turn the valve stem counterclockwise by using a hexagonal wrench.

3 Turn the valve stem until it is stopped.

4 Tighten the cap securely.

⚠ CAUTION

- ***When you use the service port, always use a charging hose, too.***
- ***Check the leakage of refrigerant gas after tightening the cap.***
- ***Must use a spanner and wrench when you open/tighten the valve stem.***

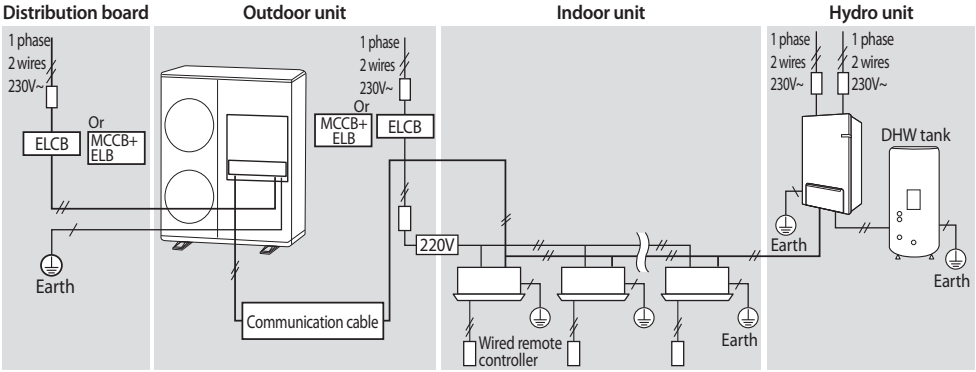
Electrical Connections

⚠ CAUTION

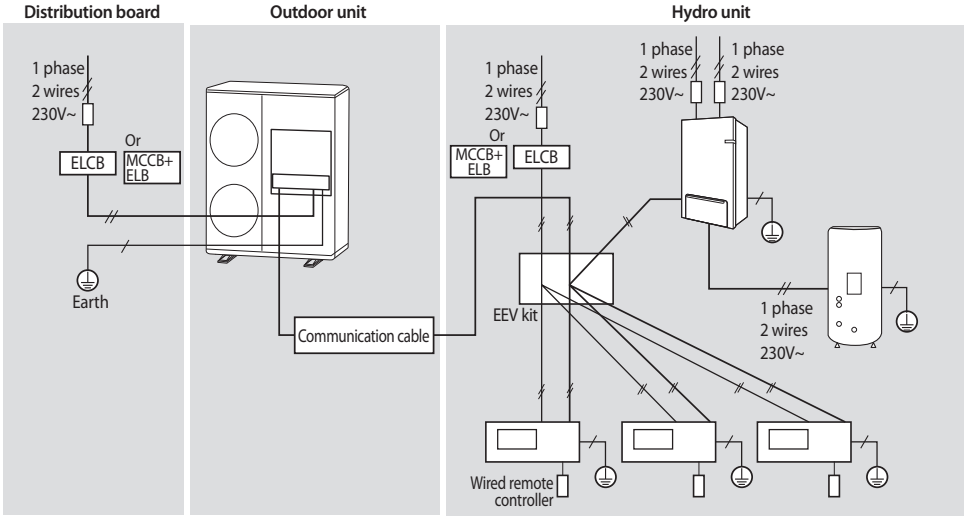
- ***Install the outdoor unit on a hard and even place that can support its weight.***
  - If the place cannot support its weight, the outdoor unit may fall down and it may cause injury.
- ***The electric work must be done by service agent or similarly qualified persons according to national wiring regulations and use only rated cable.***
  - If the capacity of the power cable is insufficient or electric work is not properly completed, electric shock or fire may occur.
- ***Make sure there is no leakage after installation.***
  - Toxic gas may generate when refrigerant gas contacts with fire.
- ***Install the outdoor unit correctly according to the installation manual.***
  - An incorrect installation may cause a water leakage, electric shock or fire and so on.
- ***The installation must be done by the manufacturer or its service agent or a similar qualified person in order to avoid a hazard.***
  - Installation by an unqualified person may cause a water leakage, electric shock or fire and so on.
- ***The unit must be plugged into an independent circuit if applicable or connect the power cable to the auxiliary circuit breaker. An all pole disconnection from the power supply must be incorporated in the fixed wiring with a contact opening of >3mm.***
- ***Switch off the main circuit breaker and the branch circuit breaker before electric work.***
- ***Perform earthing work 3 without fail. An earthing resistance should be under 100Ω. The protective earthing resistance can be applied in case of using ELCB (Earth Leakage Circuit Breaker). When using an ELCB that has a tolerance limit as 100mA per second, the protective earthing resistance is 250Ω in an electrical danger zone, else under 500Ω.***
- ***The input voltage of the indoor and outdoor unit should be within ±10% of the rated one.***
- ***For details of wiring, refer to the circuit diagram attached onto the outdoor unit.***
- ***The circuit diagram for wiring shows only the concept.***
- ***Do not connect the heater to the outdoor unit and do not install remodeled duct as you please.***
  - The capacity of the Air to water heat pump may reduce and electric shock or fire may occur.
- ***Install the power cable and communication cable of the indoor and outdoor unit at least 1.5m away from electric appliances.***
  - Noise may hear depending on the electric wave though the cables are installed away from electric appliances.
- ***Install the indoor unit away from lighting apparatus using the ballast.***
  - If you use the wireless Remote controller, it may not operate normally.

Overall System Configuration

Connection of the power cable (1 phase 2 wires)



Connection of the power cable (1 phase 2 wires using Electronic Expansion Valve kit)



CAUTION

- ***Install cabinet panel near the outdoor unit for the convenience of service and emergency operation off.***
- ***Make sure to install the circuit breaker with the over-current and electric leakage protection.***

Specification of Electronic Wire of the Outdoor Unit

Outdoor unit	Power Supply	Max/Min(V)	Max. Current	MCCB+ELB(A) or ELCB(A)	Power cable (mm^2)		Earth cable (mm^2)	Max Length (m)
					CV	VV		
RD060PHXEA RD070PHXEA RD080PHXEA	230V~/50Hz	253/209	16.0	40	4.0	6.0	6.0	18
RD110PHXEA RD140PHXEA RD160PHXEA	230V~/50Hz	253/209	25 28 30	40	4.0	6.0	6.0	18

- The power cable is not supplied with the Air to water heat pump.
- MCCB : Molded Case Circuit Breaker, ELB : Earth Leakage Breaker.
- ELCB : Earth Leakage Circuit Breaker.

Specification of Electronic Wire of the Outdoor Unit

Power Supply (1 Phase)				Earth Cable (mm^2)	Communication cable (mm^2)
Power Supply	Max/Min(V)	Power cable (mm^2)	Max length		
230V~/50Hz	253/209	2.5	Decided by power drop among indoor units	2.5	0.75~1.25

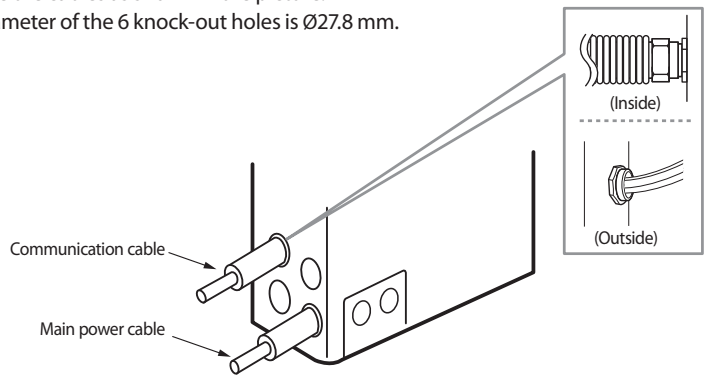
- Select the thickness and length of power cable less than 10% of voltage drop from input voltage.

CAUTION

- ***You should connect the power cable into the power cable terminal and fasten it with a clamp.***
- ***To protect the product from water and possible shock, you should keep the power cable and the connection cord of the indoor and outdoor units in the iron pipe.***
- ***Must keep the cable in a protection tube.***
- ***Keep distances of 50mm or more between power cable and communication cable.***
- ***Each indoor unit should be supplied between maximum and minimum voltage values (253V~209V).***

Power Wiring and Communication Wiring Configuration

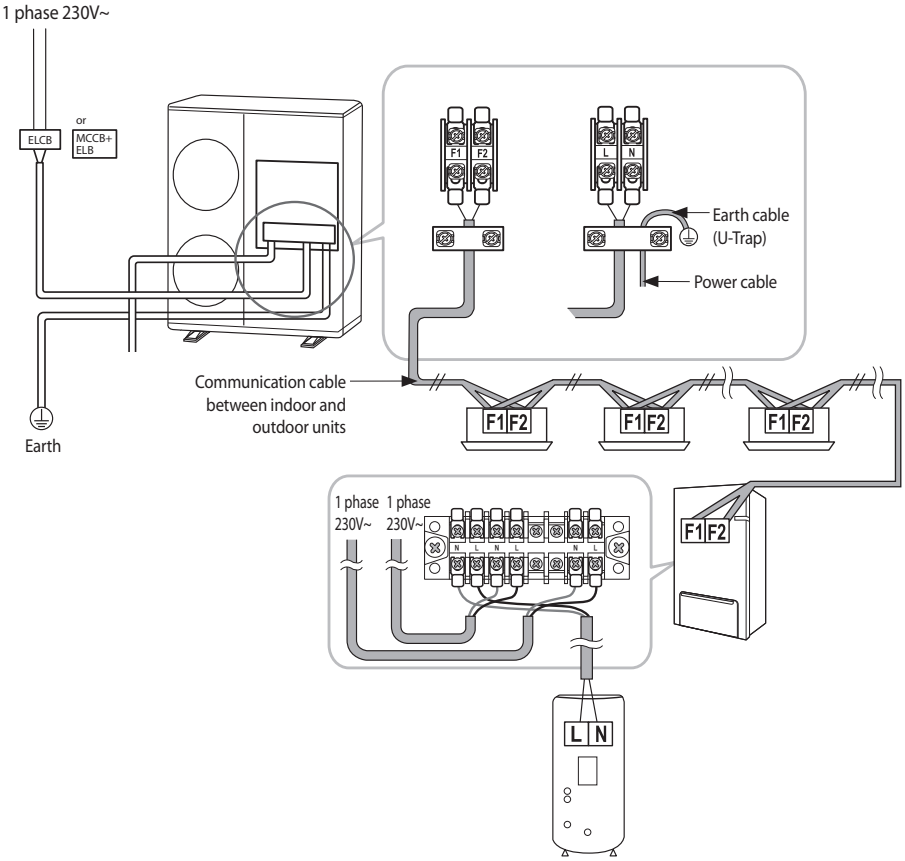
- Be sure to run the power supply cable and the communication cable through electrical conduit as seen in the picture.
- Install the communication cable, indoor power cable and the main power cable in the cable tube.
- Secure the cable tube to the outdoor knockout using the CD connector and bushing.
- Arrange the cables as shown in the picture.
- The diameter of the 6 knock-out holes is Ø27.8 mm.



CAUTION

- ***Make a knockout hole by driving in a nail.***
- ***When installing the cables through the knockout hole, remove all burrs and protect them with the protection tape.***
- ***Apply rust resisting paint around the hole.***

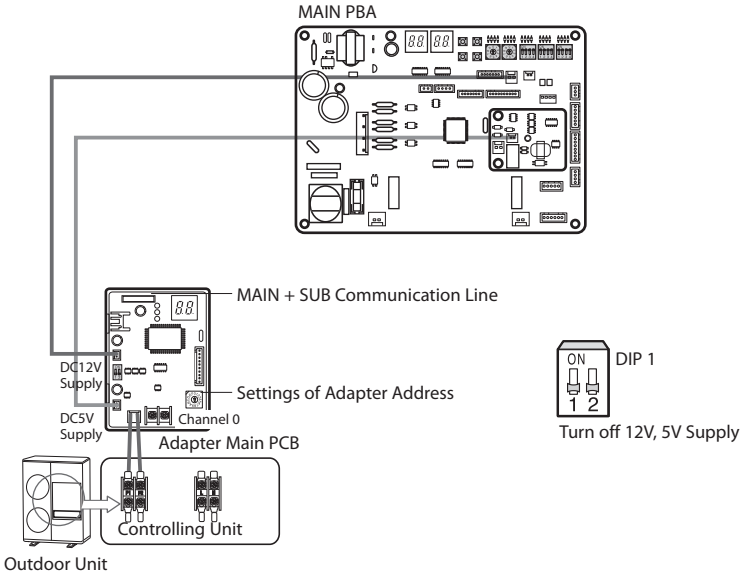
1 phase 2 wires (230V~)



CAUTION

- ***When removing the outer cover of the power cable, use the appropriate tools to prevent damaging the inner cover.***
- ***Make sure to place the outer cover of the power cable and the communication cable, at least 20mm into the electrical parts.***
- ***Communication wiring should be done separately from the power cable and other communication cables.***

Installing the Transmitter (MIM-B13A)



CAUTION

- ***When installation is carried out, the distance between the first and last transmitter should be kept within 1000m.***
- ***Turn off the power supply before installation.***
- ***Follow the electric wiring safety standards when electrical wire is installed, and to avoid danger to users, the wire should pass through the wall.***

Connecting the Power Terminal

- Connect the cables to the terminal board using the compressed ring terminal.
- Connect the rated cables only.
- Connect using a wrench which is able to apply the rated torque to the screws.
- If the terminal is loose, fire may occur caused by arc.
  If the terminal is connected too firmly, the terminal may be damaged.

Tightening Torque (kgf.cm)	
M4	12.0~14.7
M5	24.4~29.8

Installing the Earth Wire

- Earthing must be done by your installation specialist for your safety.
- Use the earth wire by referring to the specification of the electric cable for the outdoor unit.

Earthing the power cable

- The standard of earthing may vary according to the rated voltage and installation place of the Air to water heat pump.
- Earth the power cable according to the following.

Power condition \ Installation place	High humidity	Average humidity	Low humidity
Electrical potential of lower than 150V		Perform the earthing work 3. Note 1)	Perform the earthing work 2 if possible for your safety. Note 2)
Electrical potential of higher than 150V	Must perform the earthing work 3. Note 1) (In case of installing circuit breaker)		

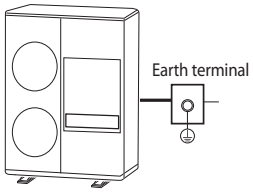
Note 1) Earthing work 3

- Earthing must be done by your installation specialist.
- Check if the earthing resistance is lower than 100Ω.
  When installing a circuit breaker that can cut the electric circuit in case of a short circuit, the allowable earthing resistance can be 30~500Ω.

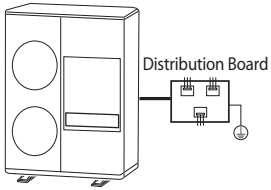
Note 2) Earthing at dry place

- The earthing resistance should be lower than 100Ω.
  (Even in worst case it should be lower than 250Ω.)

※ When using the terminal for earthing only



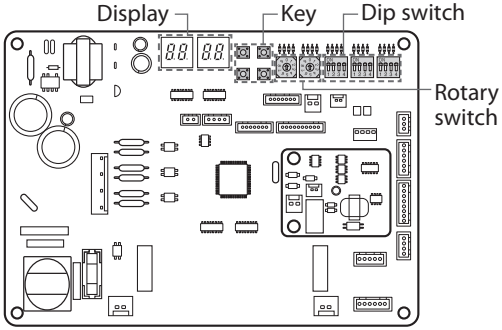
※ When using earthing of the switchboard



Setting the Option Switch and Function of the Keys

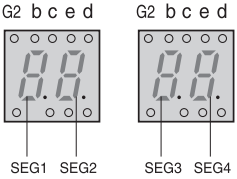
Option Switches in PBA of the Outdoor Unit

※ Main PBA

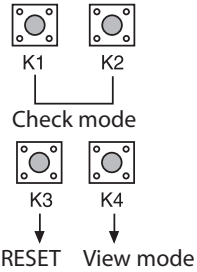


Key Function of the Outdoor Unit PBA

※ Display



※ KEY



※ Function of KEY

Number of pressing	K1 (Heating)	K2 (Cooling)
1	Adding refrigerant in heating mode (H 1)	Adding refrigerant in cooling mode (H5)
2	Test operation for heating (H2)	Test operation for cooling (H6)
3	Heating Pump out operation (H3)	Cooling Pump down operation (H7)
4	Vacuum(All)(t 4) (H4)	End of key operation
5	End of key operation	-

- Adding refrigerant (H 1, H5): The operation for charging additional refrigerant
- Test operation (H2, H6): Checking the indoor and outdoor unit operation
- Recovery of refrigerant (H7): Operation for collecting refrigerant to the outdoor unit when moving or repairing the outdoor unit .
- Refrigerant release (H3): Operation for releasing the refrigerant on the outdoor unit to the indoor unit pipes.

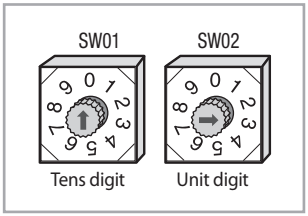
※ Function of K4

Number of pressing	Display contents	Display		
		SEG 1	SEG 2,3,4	Contents
	Press for 5 seconds	SW version display		SW version
1	Current frequency	1	0, 3, 0	Display current frequency
2	Target frequency	2	0, 3, 0	30Hz
3	Outdoor temperature	3	0, 3, 0	30˚C
4	Discharge Temp	4	1, 0, 5	105˚C
5	OLP Temp	5	1, 0, 5	105˚C
6	Cond Mid Temp	6	0, 4, 5	45˚C
7	Double pipe Out Tube Temp(Tso)	7	0, 4, 5	45˚C
8	High Pressure	8	3, 2, 1	3.21 MPa (32.73 kgf/cm^2)
9	Current Fan RPM	9	7, 0, 0	700RPM
10	Double pipe EEV	A	1, 8, 0	180Step
11	Main EEV	B	1, 5, 0	1500Step (Full open position)
12	Current	C	1, 5, 0	4/5/6HP:30A
13	Number of connected indoor units	D	0, 1, 0	10
14	Number of operating indoor units	E	0, 1, 0	10
15	Total capacity of operating indoor units	F	1, 2, 0	12.0kW

Indoor Unit Setup Range

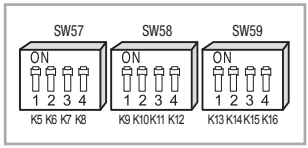
Outdoor unit	Maximum of connected indoor units
RD060PHXEA RD070PHXEA RD080PHXEA	추후
RD110PHXEA RD140PHXEA RD160PHXEA	5

✳ For example: Set the SW01 to '0' ans SW02 to '3' if 3 indoor units are installed.



Dip Switch Setup

Switch No.	Function (Communication Tracking)
K5	
ON	Set indoor unit address manually
OFF	Set indoor unit address automatically



Switch No.		Function (Cooling capacity compensation)
K7	K8	
ON	ON	No Cooling Frequency compensation (Default)
ON	OFF	Frequency compensation 105% (frequency*compensation value)
OFF	ON	Frequency compensation 110% (frequency*compensation value)
OFF	OFF	Frequency compensation 115% (frequency*compensation value)

Switch No.		Function (Night silence)
K9	K10	
ON	ON	Not use Night silence (Default)
ON	OFF	Night silence Step_1
OFF	ON	Night silence Step_2
OFF	OFF	Night silence Step_3

Switch No.		Function (Heating capacity compensation)
K11	K12	
ON	ON	No high pressure target (Default)
ON	OFF	High pressure target [standard 0.2MPa (2.03 kgf/cm^2)]
OFF	ON	High pressure target [standard -0.1 MPa (1.01 kgf/cm^2)]
OFF	OFF	High pressure target [standard +0.1 MPa (1.01 kgf/cm^2)]

※ Standard:30MPa

Switch No.		Function (All electric current Option)	6kW	7kW	8kW	11kW	14kW	16kW
K13	K14							
ON	ON	All electric current (Default)				25A	28A	30A
ON	OFF	All electric current I_Down_OP1				23A	26A	28A
OFF	ON	All electric current I_Down_OP2				20A	22A	24A
OFF	OFF	All electric current I_Down_OP3				20A	20A	20A

Pump Down Procedure

Objective of Pump Down

For product repairs and indoor unit relocation, pump down operation must be done to collect the refrigerant to the outdoor unit and minimize the leakage within system.

Cautions When Performing Pump Down

- Product limits amount of refrigerant in the outdoor unit due to slim design.
- Collect the majority of the refrigerant in the system in an empty refrigerant vessel and perform a pump down operation with remaining refrigerant. Maximum amount of refrigerant is 5Kg.
- If the amount of refrigerant exceeds maximum allowable limit, increased pressure may cause compressor trip or a burn out.

Cautions When Performing Pump Down

1	Fill an empty refrigerant before performing pump down operation.
2	Close the manifold gauge.
3	Close the liquid side service valve.
4	Press the K2 button on the outdoor unit PCB three times. (P1 will be displayed on outdoor unit PCB LED.)
5	Observe low pressure side using manifold gauge when the compressor moves.
6	When the pressure on low pressure side decrease below 0 MPa(0 kgf/cm^2) close the gas side service valve and end the pump down operation. (To end the pump down operation, press the K2 button once more or press K3 button to reset.)

CAUTION

Use an exclusive rechargeable refrigerant vessel when collecting the refrigerant. Using modified refrigerant vessel may cause explosion and cause damage or personal injury.

Note ***Relocation of the Air to water heat pump***

- Refer to this procedure when the unit is relocated.
- Carry out the pump down procedure (refer to the details of 'pump down').
- Collecting refrigerant may be hard, since multi type products exceeds allowable charging amount of refrigerant in the outdoor unit to support long piping. (Refer to page 40.)
- Remove the power cord.
- Disconnect the assembly cable from the indoor and outdoor units.
- Remove the flare nut connecting the indoor unit and the pipe.
- At this time, cover the pipe of the indoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Disconnect the pipe connected to the outdoor unit.
  At this time, cover the valve of the outdoor unit and the other pipe using a cap or vinyl plug to avoid foreign material entering.
- Make sure you do not bend the connection pipes in the middle and store together with the cables.
- Move the indoor and outdoor units to a new location.
- Remove the mounting plate for the indoor unit and move it to a new location.

Collecting Refrigerant in Refrigerant Vessel Before Pump Down Operation

If the amount of refrigerant in the system exceeded the maximum allowable limit, reduce the amount of the refrigerant by following the below instruction before pump down operation.

1 Prepare an exclusive rechargeable refrigerant vessel, scale and a manifold gauge.

2 Check the amount of refrigerant in the entire system.

3 Connect a refrigerant vessel to a outdoor unit and operated about 50% of the indoor unit in cooling mode.

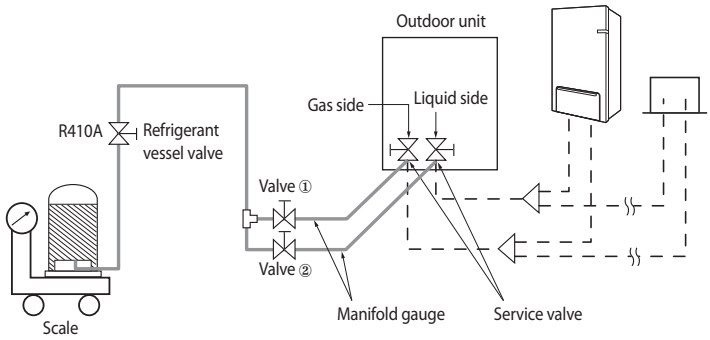
4 After 10 minutes of cooling operation, check the pressure on high pressure side with the manifold gauge. If the pressure on the high pressure side is over 30 MPa (305.91 kgf/cm^2),g reduce the number of operating indoor unit to decrease the pressure below 30 MPa (305.91 kgf/cm^2).

5 When the pressure becomes lower than 30 MPa (305.91 kgf/cm^2) open the manifold gauge valve ② which is connected to a liquid side. Then, open the valve on the refrigerant vessel for the refrigerant to flow from the liquid side pipe to a vessel.

6 Check the weight difference with the scale. When desire amount of the refrigerant is collected on the vessel, close the valve and remove the manifold gauge.

7 Make sure that the amount of the refrigerant in the vessel is about 50% of the entire system.

8 Measure the amount of refrigerant correctly to not exceed amount of collected refrigerant.



Pump Down Procedure (Continued)

When refrigerant recovery is difficult due to the large amount of refrigerant

1 Prepare manifold gauge, scale and an empty refrigerant vessel.

2 As shown below, connect the middle hose of manifold gauge to the refrigerant vessel and then connect the both ends of manifold gauge to the outdoor unit service valve individually.
(Valve of refrigerant vessel and Low pressure side valve must be closed and the high pressure side valve must be open.)

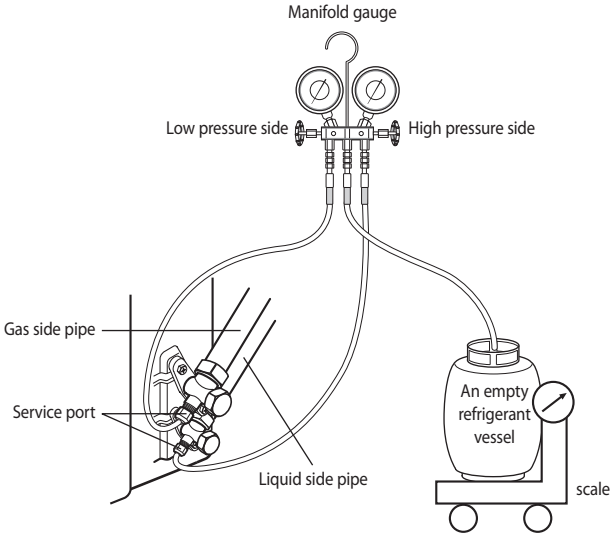
3 Start refrigerant recovery operation by pressing K2 button three times.
(Refer to page 36.)

4 After operating for 10 minutes, open the valve of refrigerant vessel and fill it with refrigerant.

5 Close the valve of refrigerant vessel when sufficient refrigerant is filled.

6 Close the liquid service valve immediately. When the low pressure falls down lower than 0, close the gas service valve.

7 Stop the operation by pressing reset button.



Completing the Installation

◆ Check the following after completing the installation.

Installation	Outdoor unit	• Check the external surface and the inside of the outdoor unit. • Is there any possibility of short circuit? • Is the place well-ventilated and ensures space for service? • Is the outdoor unit fixed securely?
	Indoor unit	• Check the external surface and the inside of the indoor unit. • Is the place well-ventilated and ensures space for service? • Check if the center of the indoor unit is ensured and it is installed horizontally.
Adding refrigerant		• Is total number of connecting indoor units in the allowable range? • Are the length and the difference between the refrigerant pipes within the allowable range? • Is the Y-joint properly installed? • Is the pipe properly insulated? • Is the quantity of the additional refrigerant correctly weighed in?
Installing the drain pipe		• Check the drain pipe of the outdoor unit and the indoor unit. • Have you completed the drain test? • Is the drain pipe properly insulated?
Installing the wiring		• Have you performed the earthing work 3 to the outdoor unit? • Is 2-core cable used? • Is the length of the wire is in the limited range? • Is the wiring route correct?
Setting ADDRESS		• Are the ADDRESSES of the indoor and outdoor unit properly set?

Final Checks and Trial Operation

Turn on the outdoor unit 3 hours before the test operation to preheat the compressor. If the compressor is not preheated, 'CH' will appear on the outdoor unit PCB.

Inspection Before Test Operation

1 Check the power cable and communication cable of the indoor and outdoor unit.

2 Check the power supply between the outdoor unit and the cabinet panel.
- ◆ Check the 220V-240V~power with the voltage meter.

3 Once the outdoor unit is turned on, it performs the tracking to check the connected indoor unit and options.

Test Operation

1 **Run the unit by KEY MODE or controller.**
- ◆ 1st- Running all indoor units by KEY MODE 2nd- Each indoor unit run separately by controller
- ◆ Inspect the compressor sound during the initial operation.
  If roaring sound is heard, stop operation.

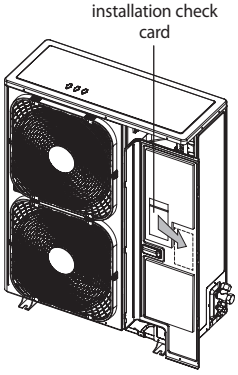
2 **Check the indoor and outdoor units' running status.**
- Check indoor unit cooling and heating air flow
- Each indoor unit controls: air flow direction, air velocity
- Indoor and outdoor unit's abnormal running noise
- Proper drainage from indoor unit in cooling mode
- Check detail running status using S-NET program.

3 **Finish test.**

4 **Explain to the customer how to use the Air to water heat pump following the user's manual.**

Filling Out the Installation Check Card and Storing it Inside of the Outdoor Unit

- ◆ The installation check card is enclosed in the installation manual.
- ◆ Installation engineer should fill out the installation card faithfully.
  - Basic contents such as installation date, name of engineer, contact number, service company, etc.
  - Additional contents such as model name of outdoor unit, remarks, refrigerant calculation due to additional pipe, etc.
  - Contents related indoor unit such as the place where indoor unit is installed, model name of indoor unit, etc.
- ◆ Store the installation check card inside of the outdoor unit and make sure not lose it.



Troubleshooting

The table below give indication about self diagnostic routine. Some of error code requires activities exclusively for Authorized Service Center.

Outdoor Unit

If an error occurs during the operation, it is displayed on the outdoor unit PCB LED, both MAIN PCB and INVERTER PCB.

No.	Main 7-seg display Error Number	Meaning
1	-	Power off/VDD NG
2	-	Power ON reset(1sec)
3	-	Normal Operation
4		The number of indoor units error
5		Indoor and Outdoor Unit communication error
6		Communication error between outdoor unit Inv and Main micom(1minute)
7		Outdoor temp sensor error(Short/Open)
8		Cond temp sensor error(Short/Open)
9		[Self-diagnosis] Cond sensor detachment
10		Discharge temp sensor error(Short/Open)
11		[Self-diagnosis] Discharge sensor detachment
12		Double pipe sensor error
13		OLP sensor error
14		Over-load prevention control
15		High pressure protection control
16		Discharge over temperature
17		ESC EEV Open
18		Heat Operation Prohibit(30°C ↑)
19		Cool Operation Prohibit(-10°C ↓)
20		Fan_1 error
21		Fan_2 error
22		Detection error of misconnected communication cable between indoor and outdoor unit
23		Comp Starting error
24		All electric current control
25		OLP temperature control compressor stop
26		IPM Over Current(O.C)
27		Comp limit error
28		DC-Link voltage under/over error
29		Comp rotation error
30		Current sensor error
31		DC-Link voltage sensor error
32		OTP error
33		AC Line Zero Cross Signal out
34		GAS Leak error(Dual/Single)

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